

## **Recommended Garmin GPS units for use with DFG GIS applications**

February 7, 2002

### **Introduction**

For several years, DFG has been deploying and successfully using Garmin GPS units. These relatively inexpensive, high quality and rugged units fit most resource grade GPS needs for the department.

Our initial purchases have almost exclusively been either the GPS 12, 12XL or 12Map units. In the past, there have been relatively few units from which to choose. Recently the Garmin product line has grown to over a dozen different models. With so many more choices, the inevitable question arises: "Which unit do I purchase?"

This document is an attempt to address the majority of the issues concerning:

- The current use of Garmins
- Newer models
- Optional choices
- Future developments

### **Current Garmin standard unit**

To date, the standard Garmin GPS models that DFG GIS has been recommending and supporting have been the 12, 12XL and 12Map. By "support", we mean that DFG-GIS has been using these models in our GPS mapping classes (for the Office of Training and Development) and have been developing ArcView extensions and applications with these models in mind.

### **Newer Garmin units**

We are currently evaluating the newer Garmin models to determine which ones we will be recommending and supporting in the future.

The introduction of new GPS models has been rapid enough that it is often difficult for us to fully evaluate the current offerings in time to make recommendations that will assist you in purchasing equipment for the current field season.

There are three main issues to be aware of:

- 1) The newer units do not allow you to download data for the date and time of the waypoints collected (Garmin Protocol). A current exception to this are the Garmin 76 and 76Map units.
- 2) These units may not have an average function for waypoint collection.
- 3) Waypoint+ (freeware) does not communicate with the newer units. You will have to buy either Garmin's MapSource software or some other shareware (i.e. OziExplorer) that can. There is a Waypoint+ (commercial version) available for ~30.00 which has yet to be evaluated.

Because of these three issues (in particular, #1) we are not offering the same level of support for the newer units (eTrex, eMap, etc...) that we do for the older units (12, 12XL, 12Map, III+, etc...) This is especially true if you are planning on using the newer units for ongoing projects or programs. The GPS 76, 76Map are supported. The current version of the AV Garmin extension will work with all Garmin GPS listed here.

## Garmin Choices

The processing of waypoint data without date and time is now supported by our applications such as the ArcView extension AV Garmin. However, the many benefits of using Garmin units (ease of use, moderate price point, good waterproof ratings, widely accepted usage, durability and our current training schedule through OTD, etc....) far outweigh concerns surrounding the omission of date and time. Because of this we will endeavor to support most Garmin units regardless of whether or not they transfer / download the waypoint's date and time.

Remember, however that the date and time of waypoint collection is in most cases, critical information and should be recorded either on your field notes or electronically along with the waypoint ID.

In choosing a GPS, keep in mind that we would like to keep the number of different models we support to a reasonable number. Your choices depend on what functional needs you have in the field. Below is a listing of the Garmin units that we presume will fill most needs.

Certain needs may factor in your decision. For example, if you really need a built-in compass and altimeter then you may want either the Summit or the Vista. If, in addition to a built-in compass and altimeter, you also need MapSource maps, your choice will be limited to the Vista only.

Price considerations may also factor into your decision. For example, the units listed below are generally in the 150, 200 or 300-dollar price range. If you have 10 teams and therefore need 10 units; that's either \$1500.00 or \$2,000.00 or \$3,000.00 (MapSource software not included and not needed for the 12, 12Map or 12XL).

Unit	Price	Mem	Pixels	Display	Ant	hrs/#	Comp	Waas	Avg
<b>12</b>	138	0	64 X 100	2.2 X 1.5	N	24/4	N	N	Y
<b>12Map</b>	318	1.44	100 X 160	2.2 X 1.5	N	36/4	N	N	Y
<b>12XL</b>	205	0	64 X 100	2.2 X 1.5	Y	24/4	N	N	Y
Legnd	227	8	160 X 288	2.1 X 1.1	N	18/2	N	Y	?
Sumit	220	0	64 X 128	2.1 X 1.1	N	16/2	Y	N	?
Vista	304	24	160 X 288	2.1 X 1.1	N	12/2	Y	Y	?

<b>GPS3+</b>	285	1.44	100 X 160	2.2 X 1.5	Y	36/4	N	N	Y
Map76	329	8	180 X 240	1.6 X 2.2	Y	16/2	N	Y	Y
GPS V ???	19		256 X 160	2.2 X 1.5	Y	25/4	N	Y	Y

Price: estimated; we have CMAS via Port Supply  
 Mem: Number of memory in megabytes for MapSource mapping data. Zero means no MapSource map uploading.  
 Pixels and Display: display in inches, combine these two for estimating viewability  
 Ant: external antenna hookup  
 hrs/#: Battery life in hours and number of batteries (batteries are AA)  
 Comp: Built-In compass and altimeter  
 Waas: Wide Area Augmentation System (when available, accuracy to 3 meters)  
 Avg: waypoint averaging function  
 \* Units in bold should store the date and time of waypoint collection. Units not in bold will not and you will have to record the waypoint ID and collection date and time by some other means. GPS V is due out in October so no data about date and time is currently available.

### Future development

For those of you who may want to use GPS in conjunction with handheld devices such as Palm Pilots or Compaq Ipaqs, the waypoint date and time will most likely not be an issue.

This is because we will likely interface the GPS with the handheld computer using the NMEA Protocol and NOT the Garmin Protocol.

Keep in mind, however, that the interfacing and integration of GPS and handheld computing devices is even further from completion than the evaluation of the newer GPS units.

### Conclusion

Using the comparison matrix above or by visiting the Garmin site itself, compare your functional field needs against the features of the units listed. Factor this in with the price and the number of units needed.

Since, the benefits of using Garmin outweigh any of the negatives DFG-GIS will strive to support at least the units listed in the above comparison matrix. My preferred short list, however are:

**eTrex Vista (~300.00)**  
**GPSMap 76 (~320.00)**  
**GPS 12 (~150.00)**  
**GPS 12Map (~280.00)**  
**GPS III+ (~280.00)**  
**GPS V (brand new)**

*Call vendors listed below for current pricing*

If you are on a tight budget, then the GPS 12 is the way to go. It works with all existing ArcView extensions and current application tools. These, of course, are free. The Waypoint+ application for downloading data from the GPS is also free. The GPS 12 does not have an external antenna hookup, but does do waypoint averaging.

If the \$300 price tag is okay, then the some of the pros and cons of the eTrex Vista, GPSMap 76, etc... are:

#### **12Map / III+**

**Pros:** supports MapSource map uploads, external antenna hookup, waypoint date and time stored

**Cons:** less map storage memory (1.44 megabytes), no built-in compass and altimeter, larger screen than eTrex (Vista, Summit, Legend, etc...)

#### **Vista**

**Pros:** more memory (24 megabytes), size (4.4"H x 2.0"W x 1.2"D), built-in compass and altimeter, weight (150 grams)

**Cons:** smaller screen, smaller size, no external antenna hookup, does not float, no waypoint date and time storage

#### **GPSMap 76**

**Pros:** floats, larger screen, tide chart, has external antenna hookup, interface matches more closely the 12XL, stores date and time of waypoints

**Cons:** less memory (8 megabytes), no built-in compass and altimeter (does have GPS elevation), weight (454 grams), size (2.7"W x 6.2"H x 1.4"D)

#### **Some 12 Stats for comparison:**

Size: 2.1 W x 5.8 H x 1.2 D inches

Weight: 269 grams

Screen: 2.2 H x 1.5 W inches

#### **GPS V**

**Pros:** more memory (19 megabytes), same form factor as GPS III+, external antenna attachment, may support waypoint date and time storage, WAAS capable

**Cons:** not enough information available at present time

## Vendors

- GPS Units

Port Supply, Inc. is only one of many authorized Garmin dealers. This vendor is listed for the sake of simplicity of the presentation here, to give an example of 'street prices' for these products, and because, from DFG's experience, this vendor offers favorable discounts and good service to DFG.

Port Supply  
500 Westridge Drive  
Watsonville, CA 95075  
Contact: Chris Deaver, DFG Sales Representative  
Tel: 800-621-6885 extension 4265  
FAX: 800-825-7678

Garmin units are also sold at REI, Fry's, Best Buy and many other retail outlets.

- Cables

Online sources for lower cost cables can be found at:

<http://pfranc.com/cgi-bin/list>

I have had good personal and DFG buying experiences with:

<http://www.blue-hills-innovations.com/blmstr.htm>

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## Support

GIS and GPS support can be obtained by contacting anyone of the following staff.

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GIS folks have also assisted or instructed in DFG GPS classes.

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\* Trimble GPS experienced

### **Acknowledgements**

Lora Konde and Patrick Gaul for their valuable input and suggestions.

Randy Imai for loaning WHADB the eTrex Vista Garmin units.

Eric Loft for purchasing the Garmin GPSMap 76 unit and monetarily supporting the "future development" of GPS and handheld computing at DFG.

Curtis Milliron who emphasized the need for this document.

Paul Veisze for purchase of the eTrex Summit and eMap Garmin units.